

# Broadband Reflective Coating Process for Large FUV OIR Mirrors, Phase I

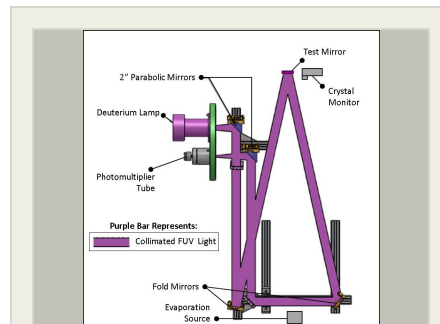
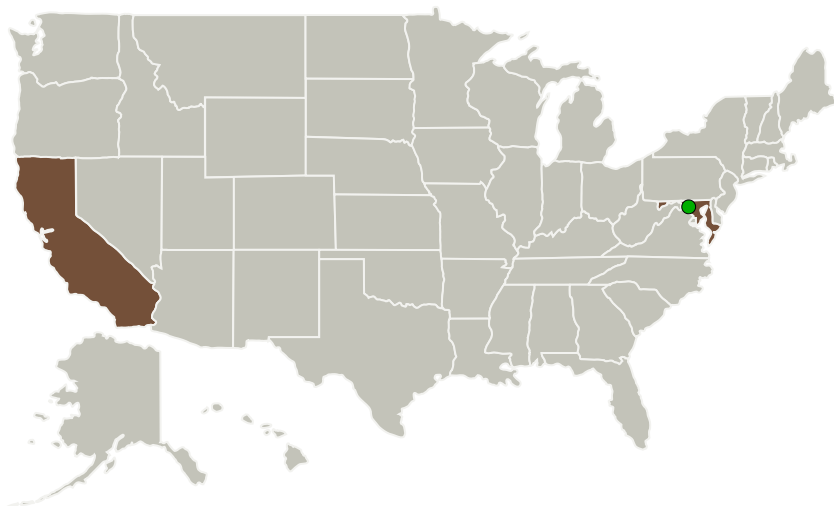
Completed Technology Project (2014 - 2014)



## Project Introduction

ZeCoat Corporation will develop and demonstrate a set of revolutionary coating processes for making broadband reflective coatings suitable for very large mirrors (4+ meters). Decades of research and flight missions (Hubble, GALAX and FUSE) have utilized metal fluorides such as,  $\text{MgF}_2$  and  $\text{LiF}$ , applied to Al to achieve FUV OIR coating requirements. While metal fluoride-protected Al remains the best option for meeting broadband reflectance requirements (90-nm to 2500-nm), ZeCoat offers a means to build upon the best known and proven coating recipe (the GSFC 3-step process) by: 1) utilizing ZeCoat's unique precision motion-controlled deposition system to uniformly apply a 5-nm layer (a requirement of the GSFC recipe) of coating material to a large coating area, 2) protecting mirror assemblies from damaging high temperatures by heating only the mirror surface using radiant heat (the GSFC process requires a 220C metal-fluoride deposition temperature), 3) using an FUV reflectometer (120-nm to 180-nm) integrated into the coating chamber to optimize the coating process for FUV reflectance and 4) investigating the feasibility of using a layer of Sn to protect LiF from degradation due to atmospheric moisture and organic contamination during ground storage and re-evaporate the Sn once the observatory is placed in-orbit.

## Primary U.S. Work Locations and Key Partners



Broadband Reflective Coating Process for Large FUV OIR Mirrors Project Image

## Table of Contents

Project Introduction	1
Primary U.S. Work Locations and Key Partners	1
Project Transitions	2
Images	2
Organizational Responsibility	2
Project Management	2
Technology Maturity (TRL)	2
Technology Areas	3
Target Destinations	3

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Organizations Performing Work	Role	Type	Location
ZeCoat Corporation	Lead Organization	Industry	Torrance, California
● Goddard Space Flight Center(GSFC)	Supporting Organization	NASA Center	Greenbelt, Maryland

Primary U.S. Work Locations	
California	Maryland

## Project Transitions

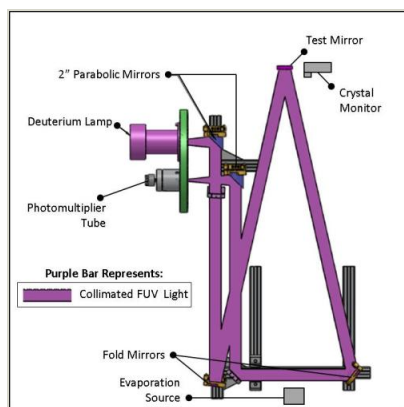
**June 2014:** Project Start

**December 2014:** Closed out

### Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/137568>)

## Images



### Project Image

Broadband Reflective Coating Process for Large FUV OIR Mirrors  
Project Image  
(<https://techport.nasa.gov/image/129088>)

## Organizational Responsibility

### Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

### Lead Organization:

ZeCoat Corporation

### Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

## Project Management

### Program Director:

Jason L Kessler

### Program Manager:

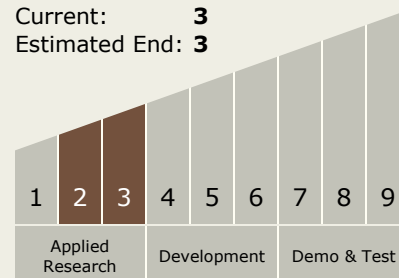
Carlos Torrez

### Principal Investigator:

David Sheikh

## Technology Maturity (TRL)

Start: 2  
Current: 3  
Estimated End: 3



# Broadband Reflective Coating Process for Large FUVOLR Mirrors, Phase I

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## Technology Areas

### Primary:

- TX08 Sensors and Instruments
  - └ TX08.2 Observatories
    - └ TX08.2.1 Mirror Systems

## Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System